EOS Science Networks Performance Report

This is a summary of EOS QA and SCF performance testing for the 1st quarter of 2015 -- comparing the performance against the requirements, including Terra, TRMM, QuikScat, Aqua, Aura, ICESat, NPP, OCO2, SMAP, and GIBS requirements.

Current results can be found on the EOS network performance web site (ENSIGHT): http://ensight.eos.nasa.gov/active_net_measure.html. Or click on any of the site links below.

Highlights:

- Requirements updated to use the June 2014 database
- Testing added to a PerfSonar node at the University of Washington
  - Rated **Excellent!**
- There are still sites with requirements, but are not tested:
  - JRC (Ispra, Italy), JAXA (Japan).
- Performance was mostly stable
  - **All nodes now rated Excellent!**
  - **GPA 4.0 !** (same as last 3 quarters)

Ratings:

Rating Categories:

Excellent: median of daily worst cases > 3 x requirement

Good: median of daily worst cases > requirement

Adequate: median of daily worst cases < requirement
and
median of daily medians > requirement

Almost Adequate: requirement > median of daily medians > requirement / 1.5
(i.e., median thruput is below requirement, but above requirement without contingency)

Low: median of daily medians < requirement / 1.5.

Bad: median of daily medians < requirement / 3.

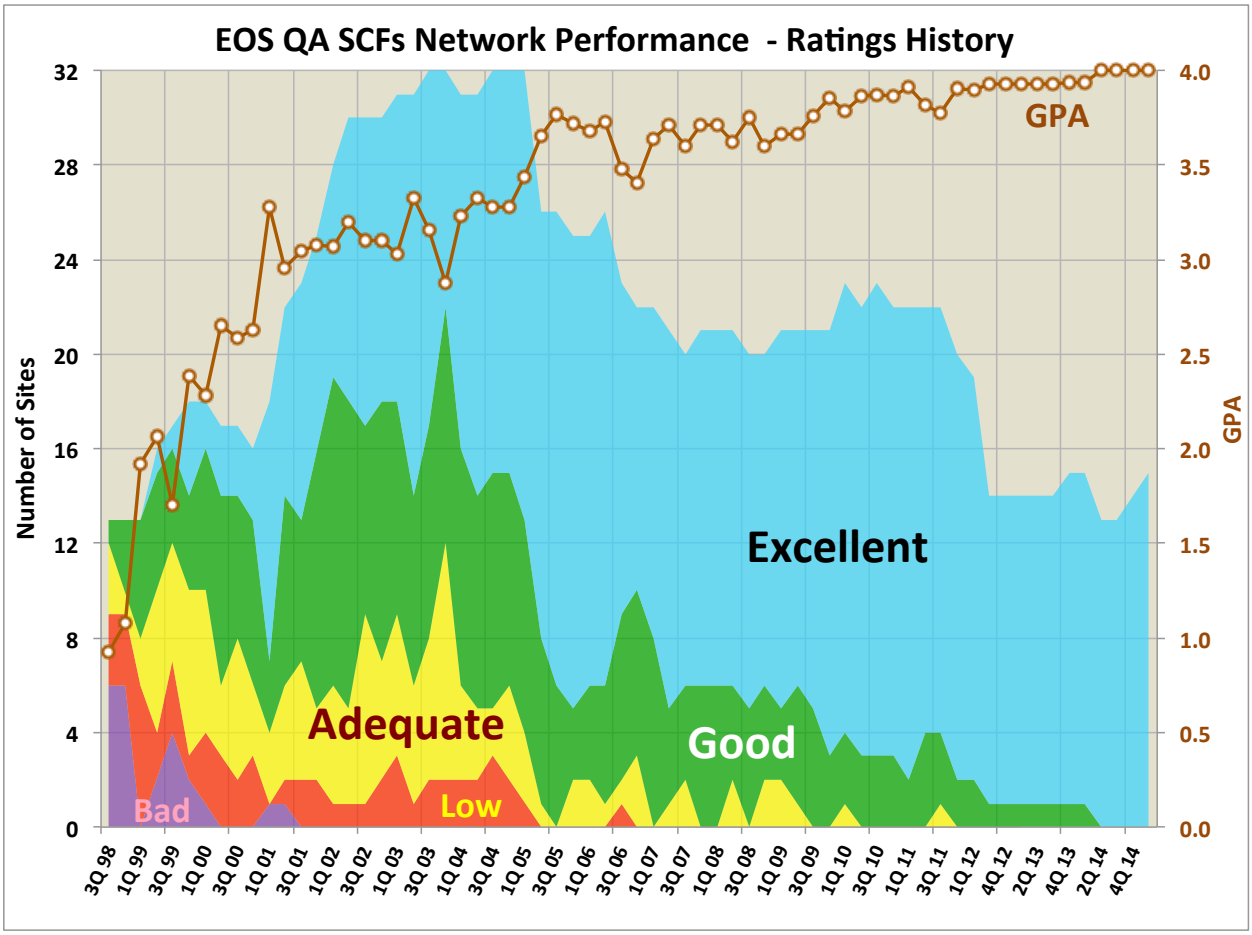
Ratings Changes:

Upgrades: ↑ None

Downgrades: ↓ None

Ratings History:

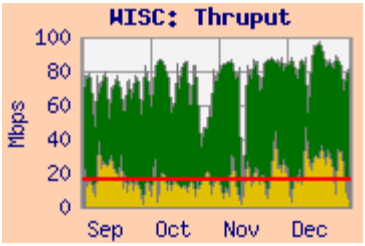
The chart below shows the number of sites in each classification since 1998. Note that these ratings do NOT relate to absolute performance -- they are relative to the EOS requirements. The GPA is calculated based on Excellent: 4, Good: 3, Adequate: 2, Low: 1, Bad: 0



Notes: The number of sites included in this chart has changed since 1Q'05 due to:

- 2Q05: Moving the reporting for 6 SIPS sites to the "EOS Production Sites" Network Performance Report.
- 2006: Testing discontinued to SAGE III Nodes, NOAA, UMD, UIUC
- 2Q07: Testing discontinued to U Washington
- 1Q09: Testing added to BADC (RAL).
- 2010: Testing to Oxford restored, ICESAT functions of Ohio State were transferred to Buffalo, testing to Buffalo added, Testing to Ohio State discontinued.
- 3Q10: UIUC added [back]; Testing to MIT discontinued
- 2Q11: Testing discontinued to LANL, PNNL; requirements added to CCRS and Univ of Auckland
- 4Q11: Testing to JRC discontinued, Wisconsin moved to production sites report.
- 1Q12: Testing to Univ Auckland, NZ failing.
- 2-3Q12: Discontinued testing to Arizona, UCSD, Colo State, Miami, Montana, SUNY SB, and Buffalo – no longer any requirements. Added testing to Hawaii, ORNL.
- 4Q13: Testing to Auckland, NZ restored.
- 2Q14: Removed results from BADC (RAL) and Toronto -- no longer any requirements.
- 4Q14: Restored results from Toronto – requirements had been removed erroneously.
- 1Q15 Restored testing to University of Washington.

Integrated Charts: Integrated charts are included for selected sites with the site details. These charts are "Area" charts, with a pink background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC/EBnet, in this example) to the destination facility (e.g., Wisconsin, in this example) obtained from routers via "netflow". The green area is stacked on top of the user flow, and represents the "adjusted" daily average iperf thruput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. The adjustments are made to compensate for various systematic effects, and are best considered as an approximation. The red line is the requirement for the flow from the source to destination facilities.



Note: User flow data is has not been available from LaRC since March 2007, so sites with primary requirements from LaRC will not include integrated graphs. (But JPL ← → LaRC flow data is available from JPL, and GSFC-EBnet ← → LaRC is available from EBnet).

EOS QA SCF Sites Summary: Network Requirements vs. Measured Performance

1st Quarter 2015				Testing							
Destination	Team (s)	Requirements		Source Node	Median Daily Best	Median mbps	Median Daily Worst	Average User Flow	Rating re Current Requirements		
		Jun-14	Jun-12						1Q 2015	4Q 2014	Route Tested
AL, GHRC (UAH) (NSSTC)	MODIS, LANCE	2.9	2.9	GSFC-EDOS	517.7	218.1	27.1	13.3	Excellent	Ex	NISN - MSFC - GHRC
CA, UCSB	MODIS	0.17	0.2	GSFC-MODIS	266.9	250.6	247.5	0.810	Excellent	Ex	EBnet - MAX - Internet2 - CENIC
Hawaii, UH	MODIS	0.02	0.0	GSFC-ENPL	2038.2	1984.9	1535.2	3.8	Excellent	Ex	EBnet - MAX - Internet2 - LA
IL, UIUC	MISR	0.56	0.56	LaRC PTH	197.1	195.3	126.6		Excellent	Ex	NISN - MAX - Internet2 - StarLight (Chicago)
MA, Boston Univ	MODIS, MISR	0.69	2.6	LaRC ASDC	179.3	106.8	74.5		Excellent	Ex	NISN - MAX - Internet2 - NOX
OR, Oregon State Univ	CERES, MODIS, MISR	0.69	0.7	LaRC PTH	190.2	189.8	183.2		Excellent	Ex	NISN - MAX - Internet2 - PNW
PA, Penn State	MISR	0.6	0.6	LaRC PTH	190.4	188.1	168.9		Excellent	Ex	NISN - MAX - 3ROX
TN, ORNL	MODIS	19.2	10.1	GSFC-ENPL	9079.8	9000.9	3084.6		Excellent	Ex	MAX - ESnet
TX, U Texas-Austin	MODIS	0.67	0.67	GSFC-ESDIS-PTH	550.6	508.2	464.8	0.337	Excellent	Ex	MAX - Internet2 - TX-learn
WA, U Washington	MISR	2.4	2.4	LaRC PTH	181.8	180.7	179.2		Excellent		Internet2 via NISN / MAX
Canada, U. of Toronto	MOPITT, GEOS	0.1	0.1	LaRC PTH	192.7	192.4	113.8		Excellent	Ex	NISN - StarLight (Chicago) - CA*net
Canada, CCRS: Ottawa	CEOS, MODIS	1.1	1.1	GSFC-MODIS	208.3	205.6	201.7	5.8	Excellent	Ex	EBnet - MAX - Internet2 - CA*net
Italy, Ispra (JRC)	MISR	9.7	9.7		n/a	n/a	n/a				NISN / MAX / Géant (DC) / GARR
New Zealand, U Auckland	MISR	0.28	0.28	LaRC PTH	182.2	180.3	172.4		Excellent	Ex	NISN - StarLight (Chicago) - I2 - Reannz
UK, Oxford	HIRDLS	0.15	0.37	GSFC-ENPL-PTH	2434.0	1561.9	659.1	0.5	Excellent	Ex	MAX - Géant (DC) - JAnet
UK, BADC (RAL)	HIRDLS	-0-	0.2	GSFC-ESDIS-PTH	36.6	33.2	26.2	0.3			EBnet - MAX - Géant (DC) - JAnet
UK, London (UCL)	MISR, MODIS	0.56	0.56	LaRC PTH	175.6	170.7	42.5		Excellent	Ex	NISN - MAX - Géant (DC) - JAnet

Significant Change

*Rating Criteria:

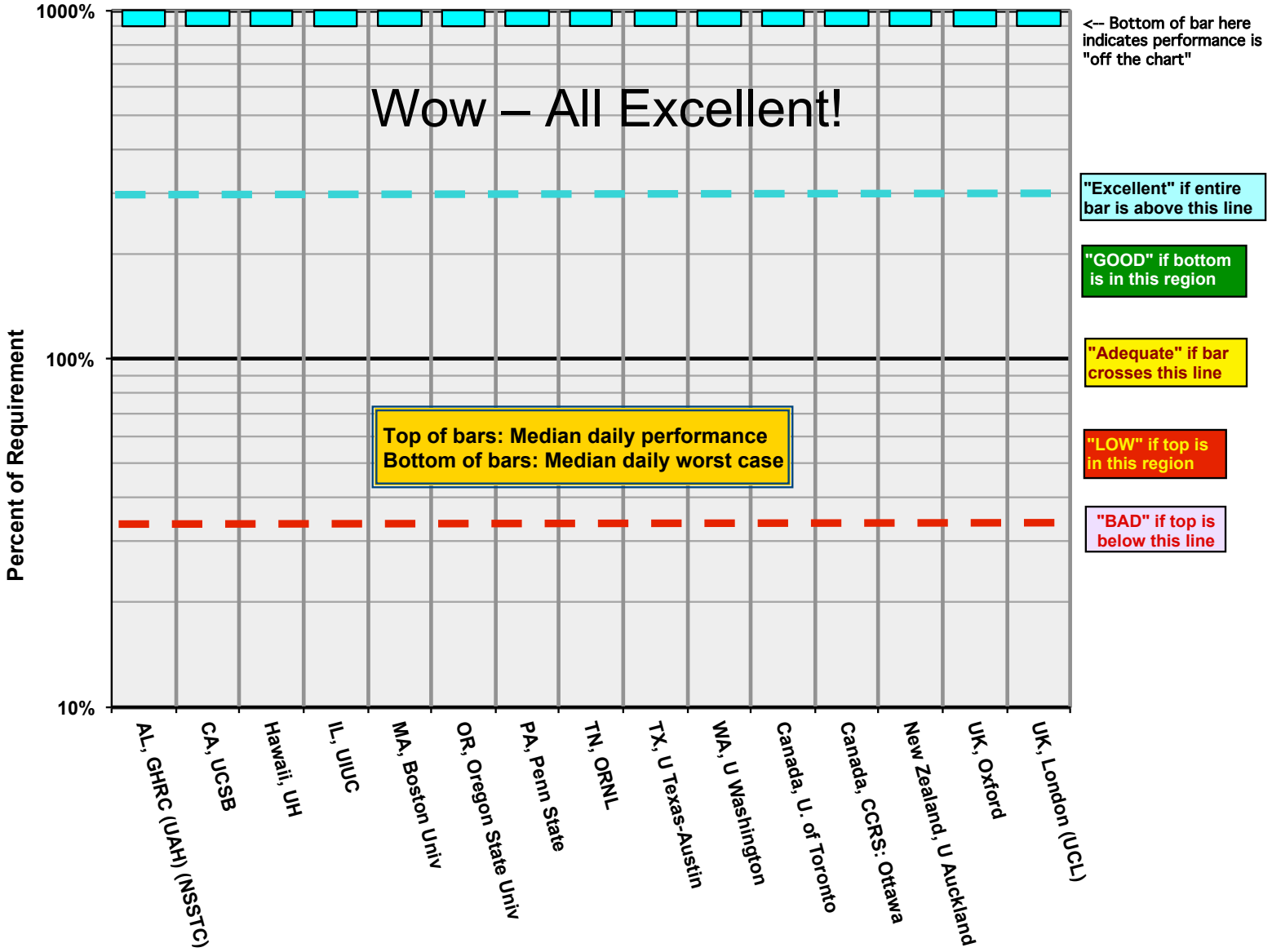
Excellent	Median Daily Worst >= 3 * **Requirement**
Good	Median Daily Worst >= **Requirement**
Adequate	Median Daily Worst < **Requirement** <= Median Daily Median
LOW	Median Daily Median < **Requirement**
BAD	Median Daily Median < **Requirement** / 3

Summary

Rating	Current: 1Q 2015	Prev Report
Excellent	15	14
Good	0	0
Adequate	0	0
LOW	0	0
BAD	0	0
Total	15	14
GPA	4.00	4.00

EOS QA SCF Sites

Daily Median and Worst Performance as a percent of Requirements



Details on individual sites:

Each site listed below is the DESTINATION for all the results reported in that section. Other tests are also listed. The three values listed are derived from [nominally] 24 tests per day. For each day, a daily best, worst, and median is obtained. The values shown below are the medians of those values over the test period.

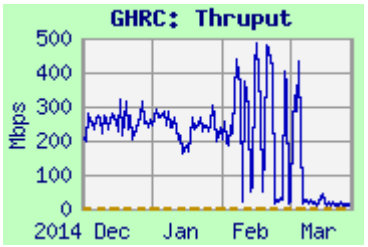
1) AL, GHRC (UAH) (aka NSSTC)

Rating: Continued **Excellent**

Teams: AMSR, MODIS, LANCE
Domain: nsstc.uah.edu
Web Page:http://ensight.eos.nasa.gov/Missions/terra/NSSTC.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-EDOS	517.7	218.1	27.1	NISN / MSFC



Requirements:

Source Node	FY	Mbps	Rating
MODIS	'12 –	2.9	Excellent

Comments: Testing was initiated in December '10 from GSFC-EDOS via both NISN and Internet2 for LANCE flows. Testing from MODAPS-PDR via I2 was initiated in November '12. That testing was discontinued in March 2014 – on request from the GHRC POC.

Testing was initiated at the end of April 2014 from **GSFC-ENPL** and **LaRC-PTH** to a bwctl server at UAH. This testing failed in Mid May, was restored in July, then failed again in late July.

Testing to a new LANCE Server via NISN was started in October 2014. Thruput became very noisy in February, and dropped in March, but remained well above 3 x the MODIS requirement, so the rating remains **Excellent**

User flow is measured for GSFC to GHRC, combined for the NISN and UAH addresses. The major flow is MODIS NRT to NISN addresses, but both paths have significant user flows. **The average user flow this quarter was 13.3 mbps – over 4 x the requirement!**

Notes:

- There is no longer a CERES requirement from LaRC (was 6.9 mbps).
- Testing between GHRC, RSS and NSIDC for AMSR-E (Aqua) is now in the "Production Sites" report.

2) CA, UCSB :

Ratings: GSFC: Continued **Excellent**

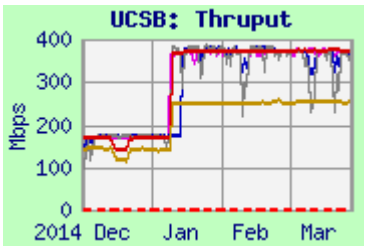
Teams: MODIS

Domain: ucsb.edu

Web page: http://ensight.eos.nasa.gov/Missions/terra/UCSB.shtml

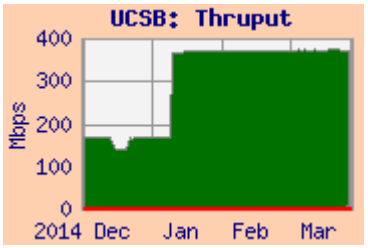
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODIS	266.9	250.6	247.5	MAX / I2 / CENIC
GSFC-GES DISC	372.3	371.1	363.4	
GSFC-ENPL	374.0	369.0	253.0	
EROS-LPDAAC	373.6	371.2	307.7	StarLight / I2 / CENIC
EROS-PTH	382.0	369.0	228.0	



Requirements:

Source Node	FY	kbps	Rating
GSFC	'12 -	170	Excellent



Comments: The GSFC requirement was reduced (was 3.1 mbps), and the EROS requirement was eliminated (was 2.2 mbps) in the 2012 database update.

Thruput from all sites improved with retuning this quarter. Thruput was well above the requirement, so the rating from **GSFC-MODIS** remains Excellent .

The user flow from GSFC averaged 810 kbps this period, above the flow last quarter and the requirement. The user flow from **EROS-LPDAAC** averaged 580 kbps this period, well below the old requirement.

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3) HI, University of Hawaii:

Ratings: GSFC: Continued **Excellent**

Team: MODIS

Domain: uhnet.net

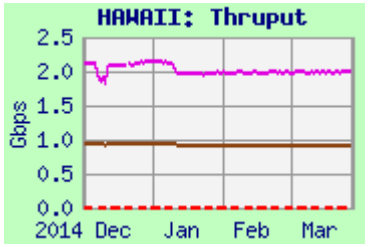
Web Page: http://ensight.eos.nasa.gov/Missions/terra/HAWAII.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL	2038.2	1984.9	1535.2	MAX / I2 / LA / UHnet
GSFC-ESTO	917.1	910.2	898.8	

Requirements:

Source Node	FY	kbps	Rating
GSFC-MODIS	'12 –	21	Excellent



Comments: Testing was initiated to a PerfSonar node at UH in April '12, based on a [very small] MODIS requirement in the new ICD. Performance from **GSFC-ENPL** improved in April '13 when testing was switched to use its 10 gig interface to a 10 gig PerfSonar node at the University of Hawaii.

The thruput from **GSFC-ENPL** is much more than the tiny requirement, so the rating remains **Excellent** . User flow from EBnet this month was 3.8 mbps again, many times higher than the requirement.

Testing was added in June from **GSFC-ESTO**, to provide an alternate source, if **GSFC-ENPL** is down. Its thruput is consistent with its Gig-E interface limitation.

4) IL, UIUC:

Rating: LaRC: **Excellent**

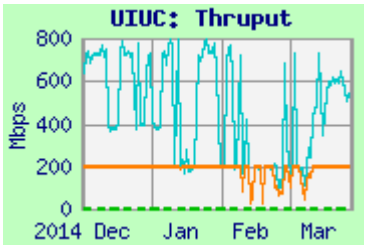
Teams: MISR

Domain: uiuc.edu

Web page: http://ensight.eos.nasa.gov/Missions/terra/UIUC.shtml

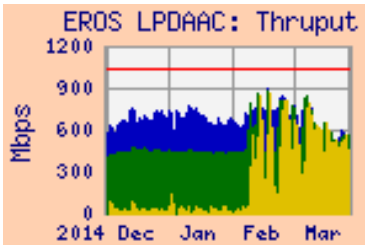
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	197.1	195.3	126.6	NISN / Chicago StarLight / MREN
GSFC-NISN	834.7	375.0	155.1	



Requirements:

Source Node	FY	kbps	Rating
LaRC ASDC	'12 -	556	**Excellent**



Comments: Testing was added to UIUC in August '10. Initially, SCP testing was initiated from GSFC and LaRC, sending files to UIUC. SCP thruput was noisy from both sources, and somewhat bimodal.

In March 2012, testing from **GSFC-NISN** and **LaRC PTH** was switched to a PerfSonar server at UIUC, with greatly improved thruput. The SCP tests were discontinued in May 2012.

Thruput from both **GSFC-NISN** and **LaRC PTH** to the PerfSonar server was seriously affected by MODIS reprocessing flow to EROS (yellow), which began in February. Both flows use the NISN SIP 10 gbps backbone to the NISN Chicago CIEF, then a NISN tail circuit to the StarLight gigapop. The MODIS flow is close to the circuit capacity, and apparently causes congestion in Chicago, reducing the performance to UIUC.

Nevertheless, the thruput from LaRC remains well above the revised requirement (which was 1.1 mbps previously); the rating remains **Excellent**. Note that outflow from **LaRC PTH** is limited to 200 mbps by agreement with CSO / NISN.

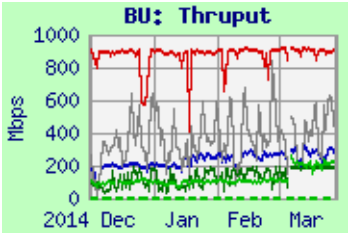
5) MA, Boston Univ:

Ratings: EROS: Continued **Excellent**
LaRC: Continued **Excellent**

Teams: MODIS, MISR Domain: bu.edu
Web Page: http://ensight.eos.nasa.gov/Missions/terra/BU.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
EROS LPDAAC	307.7	254.0	132.4	StarLight / I2 / NOX
EROS PTH	869.0	355.5	57.2	
GSFC GES DISC	922.2	898.9	533.2	MAX / I2 / NOX
LaRC ASDC	179.3	106.8	74.5	NISN / MAX / I2 / NOX
LaRC PTH	192.0	155.5	37.0	



Requirements:

Source Node	FY	mbps	Rating
EROS LPDAAC	'12 -	2.6	Excellent
LaRC ASDC DAAC	'12 -	0.7	Excellent

Comments: Thruput from **EROS LPDAAC** was noisy, but much better than the [revised lower, was 3.0 mbps] requirements, rating **Excellent**. The user flow from **EROS** averaged about 130 kbps for this period –below the requirement. Testing was initiated in March '14 from **EROS PTH**, which had much higher peaks, but was also very noisy.

Testing from **LaRC ASDC DAAC** greatly exceeded the requirements, rating **Excellent**. Performance from **LaRC PTH** was mostly steady, but is limited to 200 mbps by agreement with CSO / NISN.

Performance from **GSFC GES DISC** was higher than from any other source. There is no requirement for flows from GSFC to BU.

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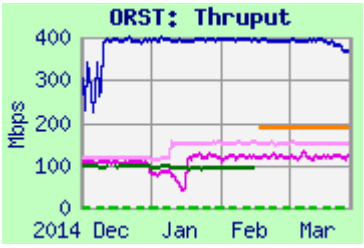
6) OR, Oregon State Univ:

Ratings: LaRC ANGe: Continued **Excellent**

Teams: MISR Domain: oce.orst.edu
Web Page:http://ensight.eos.nasa.gov/Missions/terra/ORST.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC ANGe	95.3	93.4	82.1	NISN / MAX / I2 / PNW
LaRC PTH	190.2	189.8	183.2	
JPL PODAAC	399.4	392.7	383.3	CENIC / I2 / PNW
GSFC-ESDIS-PTH	156.7	151.2	139.3	MAX / I2 / PNW
GSFC-ENPL	131.0	118.3	83.3	



Requirements:

Source Node	FY	kbps	Rating
LaRC ANGe	'12 -	694	Excellent
GSFC	'02 – '11	250	Excellent

Comments: The requirements were reduced when the requirements for CERES and MODIS were eliminated in 2012. Thruput was quite stable from all sources for this period, and was well above the requirements. Testing was started from **LaRC PTH** when the **LaRC ANGe** node was retired, with improved results; the rating remains **Excellent**. Results from the East coast sites are limited by the longer RTT and a small window size at ORST, but improved with retuning to use more streams.

7) PA: Penn State Univ:

Rating: Continued **Excellent**

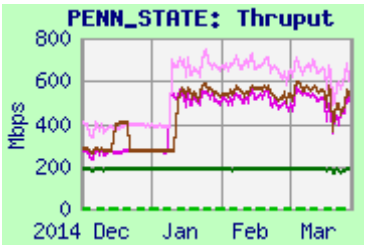
Team: MISR

Domain: psu.edu

Web Page: http://ensight.eos.nasa.gov/Missions/terra/PENN_STATE.shtml

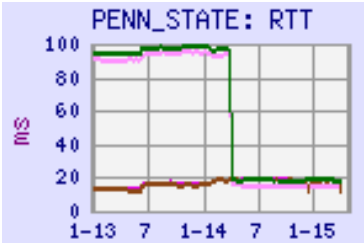
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	190.4	188.1	168.9	NISN / MAX / I2 / 3ROX
GSFC-ESDIS-PTH	796.5	658.9	474.3	MAX / I2 / 3ROX
GSFC-ENPL	587.5	510.5	355.0	
GSFC-ESTO	597.3	542.0	399.8	



Requirements:

Source Node	FY	kbps	Rating
LaRC ASDC DAAC	'03 -	556	Excellent



Comments: The previous return route problem was fixed in March 2014.

Performance from **LaRC-PTH** was very steady, limited to 200 mbps by agreement with CSO / NISN. Based on the low [reduced from 2.6 mbps] requirement, the rating remains **Excellent**.

Testing from GSFC sites was retuned in January, adding more parallel streams. From **GSFC-ESTO** (on the SEN at GSFC, not EBnet) and from **GSFC-ENPL** (direct 10GigE to MAX), the RTT has always been lower (due to the optimum return route), and the thruput was thus much higher than from other sources until they were fixed.

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8) TN, Oak Ridge National Lab:

Rating: GSFC: **Excellent**

Teams: MODIS, DAAC

Domain: ornl.gov

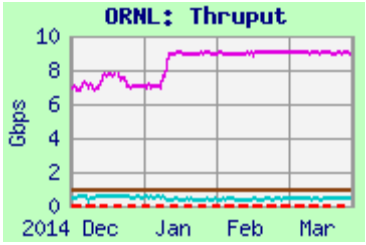
Web Page: http://ensight.eos.nasa.gov/Missions/terra/ORNL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-NISN	789.7	418.2	256.7	NISN / MAX / ESnet
GSFC-ENPL-PTH	9079.8	9000.9	3084.6	MAX / ESnet
GSFC-ESTO	983.7	983.0	840.1	

Requirements:

Source Node	FY	mbps	Rating
GSFC	'14 -	19.2	Excellent



Comments: The requirement was increased with the June '14 database update – was 10.1 mbps previously.

Testing was added in February 2014 from **GSFC-ENPL-PTH** a 10 gig connected node at GSFC, to the 10 gig PerfSonar node at ORNL, with excellent thruput.

Thruput to the PerfSonar node at ORNL stabilized from **GSFC-NISN** and **GSFC-ESTO** in December 2012. Performance was well above the requirement; the rating is therefore **Excellent**.

User flow from EBnet has been minimal, however, averaging only about 1.5 kbps this period. (But the flow monitor might be missing some EBnet to ORNL flows).

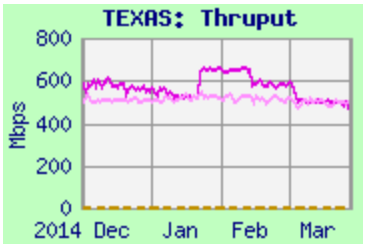
9) TX: Univ. of Texas - Austin:

Rating: Continued **Excellent**

Team: MODIS, ICESAT
Domain: utexas.edu
Web Page: http://ensight.eos.nasa.gov/Missions/icesat/TEXAS.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	623.5	560.3	467.0	MAX / I2 / TX
GSFC-ESDIS-PTH	550.6	508.2	464.8	



Requirements:

Source Node	FY	kbps	Rating
GSFC-MODIS	'12 -	666	Excellent

Comments: Thruput from GSFC-ESDIS-PTH was well above 3 x the MODIS requirement, so the rating remains **Excellent**. Average user flow from GSFC this month was 340 kbps, close to the requirement (without contingency).

From **GSFC-ENPL-PTH**, thruput is similar but a bit better. This test was moved to a PerfSonar node at UT in August 2012, with greatly improved results. The results improved further in September 2013, with the switch to the 10 gig interface from **GSFC-ENPL-PTH**. In November 2013, the Texas PerfSonar server stopped responding, so testing was switched back to the SCF.

The previous 11.1 mbps ICESAT requirement has been eliminated, and testing from ICESAT discontinued.

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10) WA: University of Washington

Rating: GSFC: **Excellent**

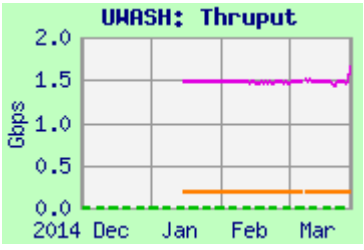
Teams: MISR
Domain: ornl.gov
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UWASH.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC-PTH	181.8	180.7	179.2	NISN / MAX / Internet2 / PNW
GSFC-ENPL-PTH	1514.1	1478.6	1368.7	MAX / Internet2 / PNW

Requirements:

Source Node	FY	mbps	Rating
GSFC	'14 -	2.4	Excellent



Comments: Testing was added to a 10 gig U Wash PerfSonar node in January 2015 from **GSFC-ENPL-PTH** and **LaRC-PTH**, with excellent thruput.

Thruput from **LaRC-PTH** was very stable, and well above the requirement, rating **Excellent**. Outflow from **LaRC-PTH** is limited to 200 mbps by agreement with CSO / NISN.

Testing from **GSFC-ENPL-PTH** was also very stable, and exceeded 1 gbps.

11) Canada, Univ of Toronto:

Rating: GSFC: Continued **Excellent**
LaRC: Continued **Excellent**

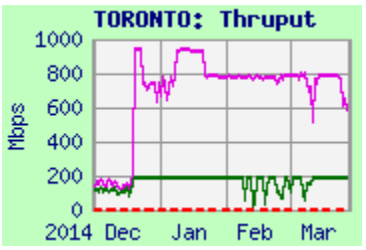
Team: MOPITT Domain: utoronto.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/TORONTO.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	192.7	192.4	113.8	NISN / StarLight / CA*net
GSFC-ENPL-PTH	796.0	781.8	502.0	MAX / I2 / NY / CA*net

Requirements:

Source Node	FY	kbps	Rating
LaRC DAAC	'02 – '13	100	Excellent
GSFC EOC	'02 – '13	512	Excellent



Comments: In the 3Q14 report, it was erroneously stated that the MOPITT team was no longer at the University of Toronto; this has now been corrected.

The Toronto PerfSonar server was readdressed in late August 2014. Testing from **GSFCENPLPTH** and **LaRC PTH** initiated to the new address, and retuned in December 2014, with improved results. Performance from **LaRC PTH** was steady, limited to 200 mbps by agreement with CSO / NISN. It was much higher than the requirement, rating **Excellent**. Thruput from **LaRC PTH** was also affected by the MODIS to EROS flow, since it shares the NISN to StarLight circuit (see 4-UIUC).

From GSFC, thruput from **GSFC-ENPL-PTH** was also well above the requirement, rating **Excellent**. User flow from GSFC averaged only 20 kbps for this period.

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12) Canada: CCRS (Ottawa)

Rating: Continued **Excellent**

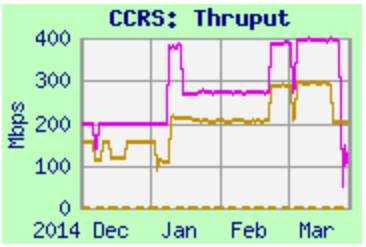
Teams: MODIS, CEOS Domain: ccrs.nrcan.gc.ca
Web Page: http://ensight.eos.nasa.gov/Missions/terra/CCRS.shtml

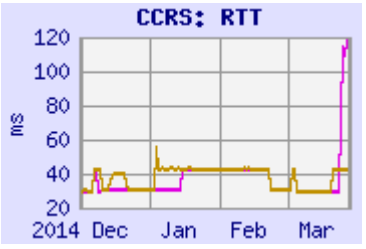
Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-MODAPS	208.3	205.6	201.7	MAX / I2 / CA*net
GSFC-ENPL	278.0	273.3	260.0	

Requirement:

Source Node	FY	mbps	Rating
GSFC-MODAPS	'11 -	1.1	Excellent





The MODIS requirement was reduced from 3.8 mbps through FY'10.

Performance from both sources was stable for sustained periods, with thruput step changes corresponding inversely to RTT changes. Testing from both sources improved in January with retuning to use more streams. Thruput from **GSFC-MODAPS** was otherwise stable, and remained much more than 3 x the requirement, so is rated **Excellent**.

Thruput from **GSFC-ENPL** was also stable.

User flow from GSFC again averaged 5.8 mbps this period, above the 3.1 mbps last quarter, and much higher than the requirement (but more consistent with the old requirement).

13) UK, Oxford Univ.:

Rating: Continued **Excellent**

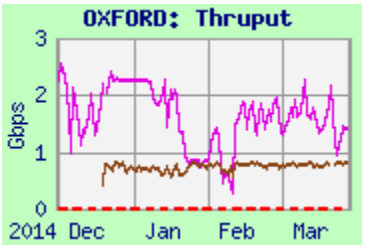
Team: HIRDLS
Domain: ox.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/aura/OXFORD.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ENPL-PTH	2434.0	1561.9	659.1	MAX / I2 / Géant (DC) / JAnet
GSFC-ESTO	847.9	763.1	470.5	

Requirements: (IST Only)

Source Node	FY	kbps	Rating
GSFC	'03 –	368	Excellent



Comments: Beginning in late March 2012, testing was switched to a PerfSonar server at Oxford, using iperf. Testing previously had used, "flood pings", which is a poor substitute for iperf, and provided much lower results. Performance improved again in June 2012 when the Oxford PerfSonar node was upgraded, and again in March 2014 by using a 10 gig interface from **GSFC-ENPL-PTH**. The thruput is much higher than the modest requirement, so the rating continues **Excellent**.

User flow from GSFC to Oxford averaged 490 kbps for this period, above the requirement, but below the 3.8 mbps during the previous period.

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14) UK, London: (University College)

Rating: Continued **Excellent**

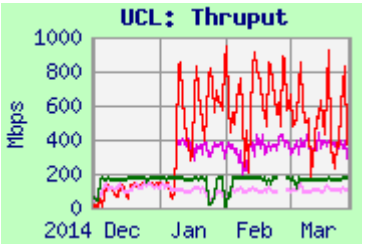
Teams: MODIS, MISR
Domain: ucl.ac.uk
Web Page: http://ensight.eos.nasa.gov/Missions/terra/UCLSCF.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	175.6	170.7	42.5	NISN / MAX / Géant / JAnet
GSFC-ESDIS-PTH	148.0	102.8	50.3	MAX / I2 / Géant (DC) / JAnet
GSFC-ENPL-PTH	647.9	363.0	143.8	
EROS-PTH	1034.8	575.2	106.0	StarLight / I2 / Géant (DC) / JAnet

Requirements

Source Node	FY	kbps	Rating
LaRC DAAC	'12 –	556	Excellent



Comments: Testing from **LaRC PTH** and GSFC-ESDIS-PTH since late 2010 is by nuttcp pulls, initiated at UCL. Testing from **GSFC-ENPL-PTH** and **EROS-PTH** was switched in January to use a PerfSonar server at UCL, with improved results.

Thruput from **LaRC PTH** and GSFC-ESDIS-PTH was similar, and improved in May 2014 with retuning. Thruput from **LaRC PTH** improved in September 2014 with a node upgrade. The median daily worst thruput from **LaRC PTH** remained well above 3 x the requirement, so the rating remains **Excellent**.

15) British Atmospheric Data Centre

Rating: **N/A**

(Rutherford Appleton Laboratory) Team: HIRDLS Domain: rl.ac.uk

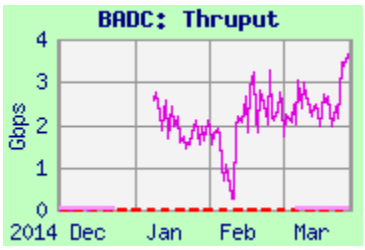
Web Page: http://ensight.eos.nasa.gov/Missions/aura/UK_RAL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
GSFC-ESDIS-PTH	36.6	33.2	26.2	MAX / I2 / Géant (DC) / JAnet
GSFC-ENPL-PTH	3853.2	2154.7	936.1	

Requirements:

Source Node	FY	kbps	Rating
GSFC	'02 – '13	190	**N/A**



Comments: There are no longer any requirements to BADC in the database – therefore no rating is assigned.

Thruput from **GSFC-ESDIS-PTH** was mostly steady, and consistently much higher than the previous requirement, so the rating would continue to be **Excellent**.

Testing from **GSFC-ENPL-PTH** was switched in January to a PerfSonar server at BADC. Performance was much higher than to the previous test node.

User flow averaged 320 kbps this quarter, above the previous requirement, and similar to last quarter (**user flow peaked at 20 mbps during 3Q14).**

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16) New Zealand

Rating: **Excellent**

Team: MISR Domain: reannz.co.nz

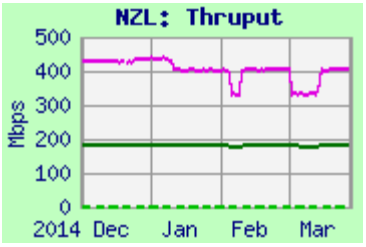
Web Page: http://ensight.eos.nasa.gov/Missions/terra/NZL.shtml

Test Results:

Source Node	Medians of daily tests (mbps)			Route
	Best	Median	Worst	
LaRC PTH	182.2	180.3	172.4	NISN / StarLight / I2 / PNW / ReanNZ
GSFC-ENPL-PTH	412.6	403.2	391.5	MAX / I2 / PNW / ReanNZ

Requirements:

Source Node	FY	kbps	Rating
LaRC	'02 –	300	**Excellent**



Comments: Testing to the University of Auckland was discontinued in November 2011. Testing was reinstated in October 2013, to a PerfSonar node in Auckland provided by the Reannz network. Note that the route to the University of Auckland uses Reannz – so the results are plausibly applicable.

Thruput from **LaRC PTH** consistently was much higher than the requirement, so the rating is **Excellent**. Thruput from **LaRC PTH** improved in September 2014 with a node upgrade. Note that thruput from **LaRC PTH** is limited to 200 mbps by agreement with CSO / NISN.

Thruput from **GSFC-ENPL-PTH** was stable, after retuning in July 2014, and better than that from **LaRC PTH.**